

Reducing Pollution from Diesel Engines

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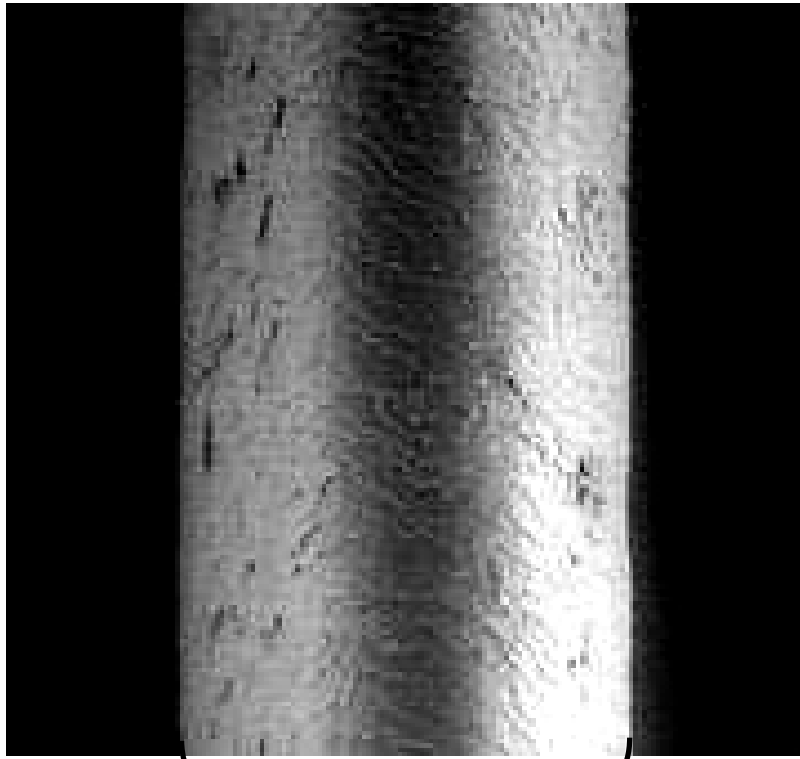


Why are We Concerned about Diesel Exhaust?

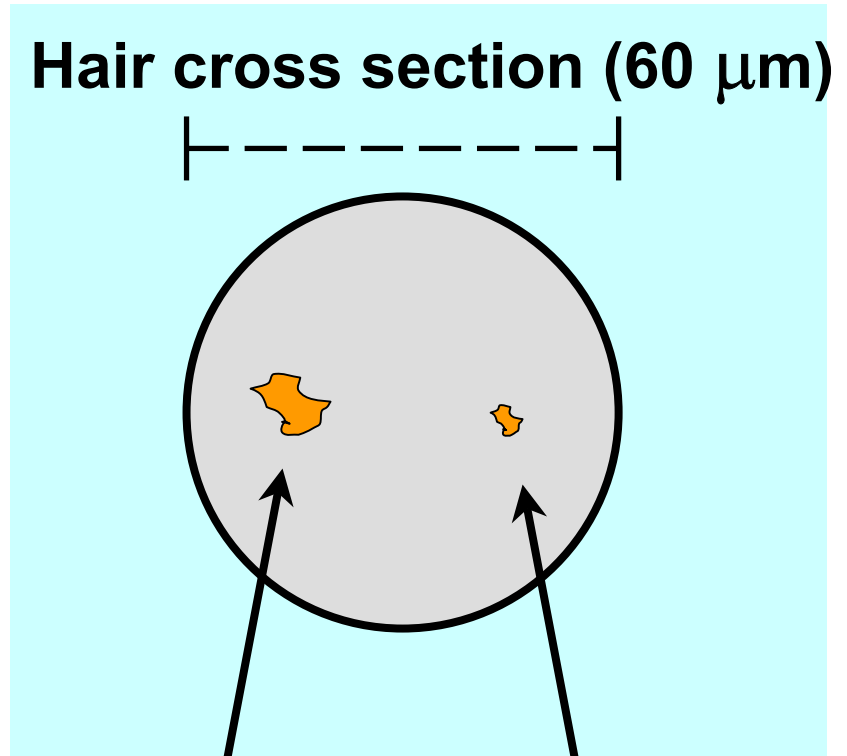


- Diesel exhaust contains fine particles which can aggravate asthma and cause lung damage as well as premature death
- EPA has classified diesel particulate matter as a likely human carcinogen
- Diesel engines are significant contributors to air pollution, especially in urban areas (e.g., ~ 50% of the directly emitted particulate matter emissions in Suffolk county come from diesel engines)

Fine Particles – How Small are They?



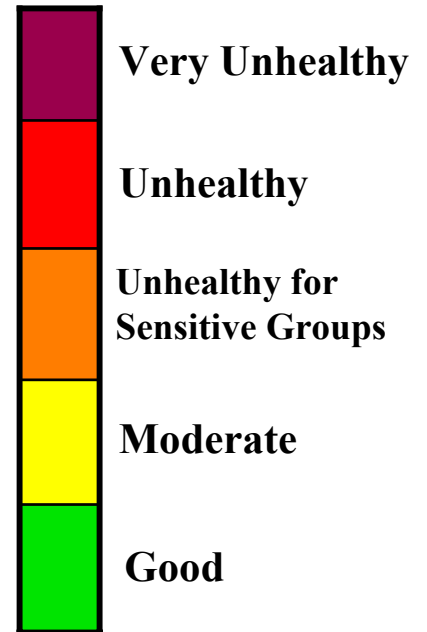
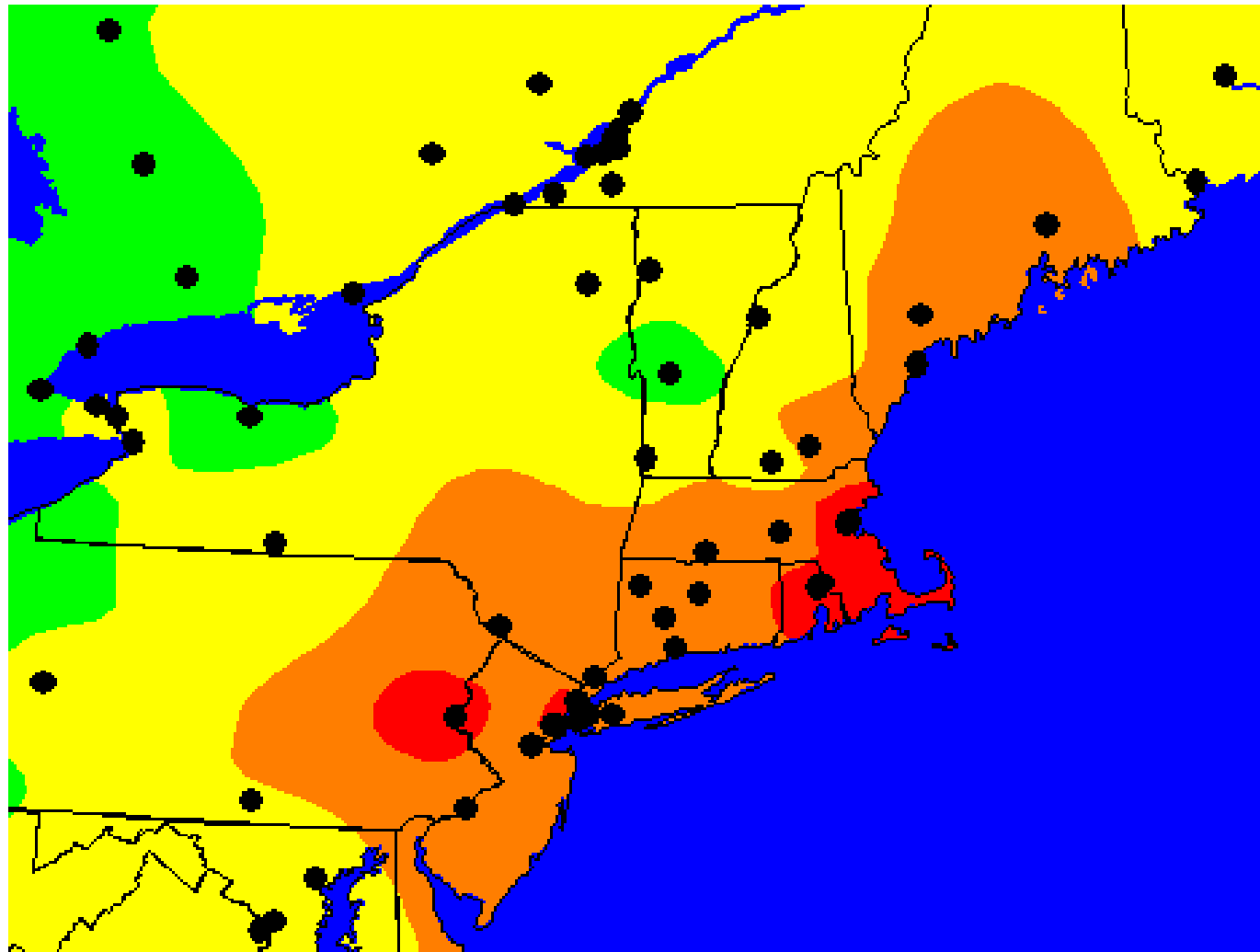
Human Hair
(60 μm diameter)



PM10
(10 μm)

PM2.5
(2.5 μm)

Unhealthy Levels of Fine Particles Can Occur Across New England



Fine particle
concentrations
on June 27,
2003

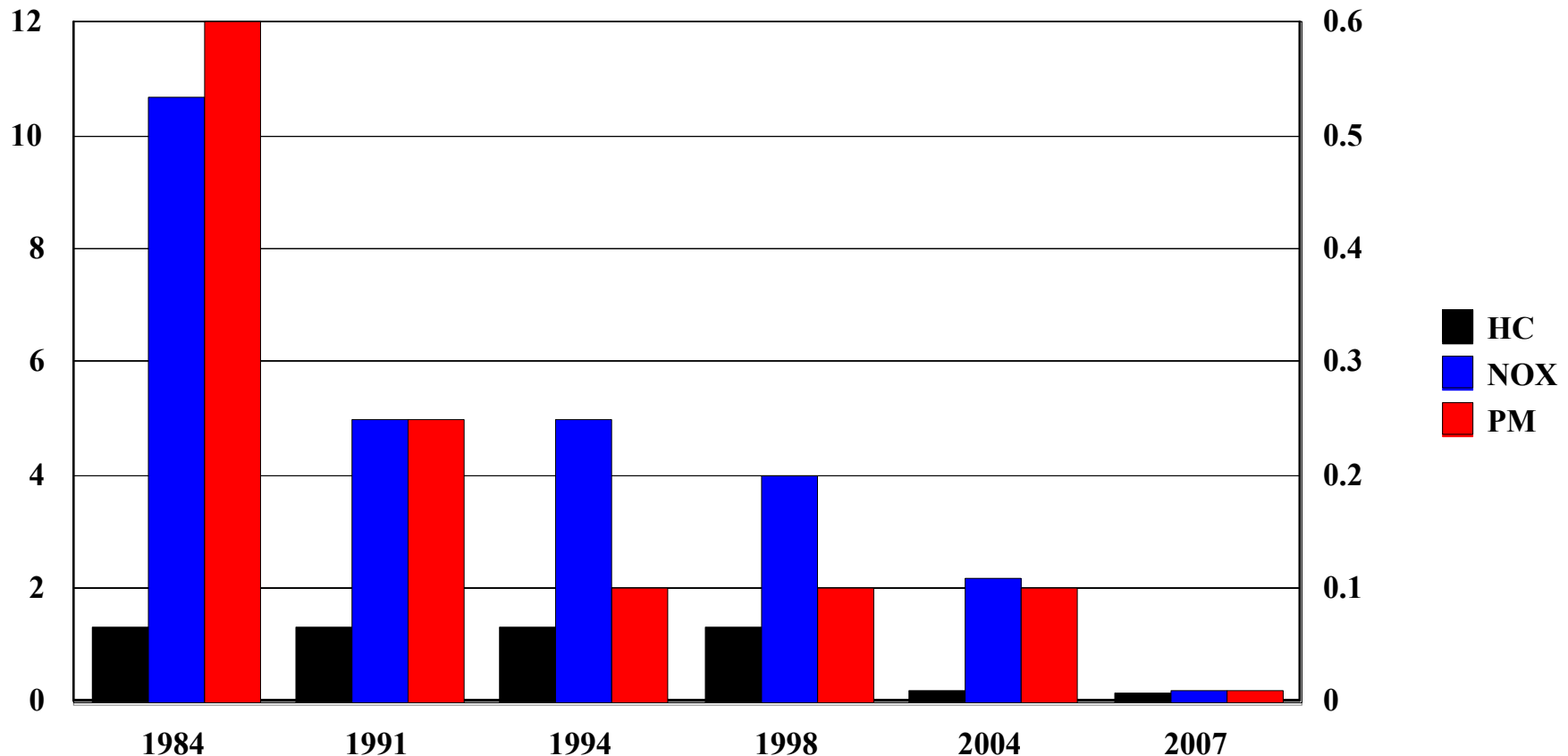
PM 2.5 AQI June 27, 2003

EPA's Emission Standards for Trucks and Buses



HC, NO_x
(g/bhp-hr)

PM
(g/bhp-hr)

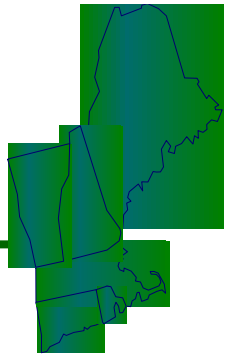


What About the Trucks and Buses on the Road Today?



- Diesel Engines last a long time
 - Some engines last between 25-30 years
- EPA's diesel regulations only apply to new vehicles
 - More stringent standards take effect in 2004 and again in 2007
 - Full benefits of these standards are years away
- EPA's National Voluntary Diesel Retrofit Program gets reductions from existing vehicles and engines today
 - Retrofit technology is available now

Regional Diesel Initiative



- EPA-New England is working closely with the New England states to reduce emissions from diesel vehicles
- There are 4 key elements:
 - Anti-Idling
 - Diesel Retrofits (Transit, Non-Road, School Bus)
 - Heavy Duty Vehicle Testing
 - Outreach

Clean Fuel/Clean Technology	% Reduction in Particulate Matter	Approximate Cost
Highway Diesel (Low Sulfur - 300 ppm)	15-25%	2-3 cents more per gallon than non-road diesel (3000 ppm)
Ultra Low Sulfur Diesel (ULSD – 15 ppm)	5-10%	5-20 cents more per gallon than highway diesel (cost differential disappears in 2006)
Particulate Matter Filter (must be used with ULSD)	60-90%	\$5,000-\$8,000
Oxidation Catalyst	20-30%	\$800-\$1,500
Biodiesel (B20 - 20% blend)	10% (increases nitrogen oxides 1-2%)	15-20 cents more per gallon than diesel
Emulsified Diesel	50% (also reduces nitrogen oxides 10%)	20 cents more per gallon than diesel



Example Retrofit Projects in Massachusetts

- Transit

- Massachusetts Bay Transit Authority (ULSD and filters and/or CNG for over 900 buses)



- Construction

- MBTA Commuter Train
- Big Dig -- (100 pieces of equipment)



- School Buses

- Boston, MA -- 100 buses w/ULSD and filters (100 more w/ULSD)
- Medford, MA -- 54 buses w/filters and ULSD (11 more w/ULSD)

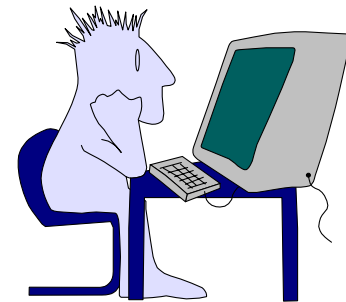


Policies to Encourage Retrofits

- EPA's Voluntary Diesel Retrofit Program
- EPA's initiative to help DPWs comply with environmental regulations
 - Through this initiative, EPA has provided over 300 municipalities with information about diesel exhaust
- MassHighway and the MBTA include retrofit requirements in construction contracts
- City of Boston's voluntary policy to encourage retrofits on construction equipment



For More Information...



- www.epa.gov/ne/eco/diesel
- www.epa.gov/otaq/retrofit
- www.epa.gov/cleanschoolbus